## Practice: 309 - Agrichemical Handling Facility

## Scenario: #1 - Storage, Mixing & Handling Pad with Roof, steep site

### Scenario Description:

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. Steep site topography mandates that storage and handling area be 2' higher than loading and mixing pad. Include a secured area for chemical storage of 16'x20'. Building is enclosed except for opening to entrance and exit the mixing pad and keeps wind blown rain out. Ventilation not an issue as liquid chemcials used, no powder. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

### Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

An agrichemical storage and handling facility is constructed inside an enclosed building. This is a common practice. An agrichemical handling facility for storage and mixing and loading is constructed to a 35' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. The storage area for rinsate tanks (16' x20') and locked chemical storage (16' x20') is elevated by 2' over the loading pad. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Total Containment Area

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 1,400

**Scenario Cost:** $35,135.03 **Scenario Cost/Unit:** $25.10

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 25 | $3,324.50 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 24 | $1,839.12 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $63.85 | 8 | $510.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | $4.38 | 350 | $1,533.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $420.16 | 10 | $4,201.60 |
| ***Labor*** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 32 | $923.20 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 40 | $830.80 |
| ***Materials*** | | | | | | |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Post Frame Building, enclosed 4 sides | 1046 | Enclosed post frame building, four walls. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, and lab | Square Foot | $9.47 | 1400 | $13,258.00 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | $31.40 | 22 | $690.80 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4' x 7'. Materials only. | Each | $1,035.24 | 1 | $1,035.24 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | $31.83 | 2 | $63.66 |
| Wall, Interior | 2304 | Interior partition wall, 10' high, 2" x 4" studs on 16" center, 3/4" plywood sheething. Includes materials, equipment and labor. | Foot | $59.75 | 36 | $2,151.00 |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallon | $1.42 | 600 | $852.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $586.94 | 1 | $586.94 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 1400 | $1,344.00 |
| Pump, Sump, less than 1/4 HP | 2582 | Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft or more, 300 GPH at 10', electric, manually operated. Includes materials and shipping (pump and motor). | Each | $159.05 | | $0.00 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $663.11 | 1 | $663.11 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $80.51 | 2 | $161.02 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 4 | $1,166.24 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #2 - Convert existing building to a storage, handling, and mixing pad

### Scenario Description:

This practice scenario is an agrichemical handling facility for storage and mixing and loading operation in an existing buliding. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

### Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

An agrichemical storage and handling facility is constructed inside an existing enclosed building. A agrichemical handling facility for storage and mixing and loading is installed with dimensions of 35' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. Entire area used is on one elevation. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. Add 3 walls for secure area that is 16' x20'. One side is ex istnig. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Total Containment Area

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 1,400

**Scenario Cost:** $14,335.22 **Scenario Cost/Unit:** $10.24

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 4 | $306.52 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $420.16 | 6 | $2,520.96 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 25 | $3,324.50 |
| ***Labor*** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 16 | $332.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 4 | $115.40 |
| ***Materials*** | | | | | | |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4' x 7'. Materials only. | Each | $1,035.24 | 1 | $1,035.24 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | $31.40 | 14 | $439.60 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $663.11 | 1 | $663.11 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 1400 | $1,344.00 |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $586.94 | 1 | $586.94 |
| Wall, Interior | 2304 | Interior partition wall, 10' high, 2" x 4" studs on 16" center, 3/4" plywood sheething. Includes materials, equipment and labor. | Foot | $59.75 | 36 | $2,151.00 |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallon | $1.42 | 600 | $852.00 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 2 | $583.12 |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $80.51 | 1 | $80.51 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #4 - Fabricated Liquid Storage with Handling Pad

### Scenario Description:

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals along with a mixing and loading pad. Due to topography, limited site space and/or geological conditions a fabricated, lined structure is needed for liquid storage area. No roof. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground
water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A)

### Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with a handling pad for mixing and loading operations. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in fabricated containment that is 30 ft x 40 ft with flexible membrane lined walls. The walls are of modular blocks stacked two for a 4ft wall height on four sides. A handling pad for mixing and loading is located next to the liquid containment and is 16' x 32' with an application equipment length of 24 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Liquid Containment Area + Handling Pad

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 1,712

**Scenario Cost:** $30,866.39 **Scenario Cost/Unit:** $18.03

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 6 | $459.78 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.37 | 2024 | $4,796.88 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $420.16 | 8 | $3,361.28 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | $4.38 | 2 | $8.76 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 19 | $2,526.62 |
| ***Labor*** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 6 | $173.10 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $22.97 | 2 | $45.94 |
| ***Materials*** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | $31.83 | 4 | $127.32 |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 512 | $491.52 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yard | $97.51 | 42 | $4,095.42 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $5.90 | 2024 | $11,941.60 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $663.11 | 1 | $663.11 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | $31.40 | 27 | $847.80 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $80.51 | 2 | $161.02 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 4 | $1,166.24 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #5 - Outdoor Liquid Storage with a Roofed Building for Dry Chemical Storage and Handling Pad

### Scenario Description:

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals along with a roofed mixing and loading pad that is also sized to store dry chemicals. Site soils are suitable for making a liquid tight, temporary containment. This practice addresses water quality degradation due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A), Roof Runoff Management (558)

### Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with a roofed building to store dry agrichemicals with a handling pad for mixing and loading operations. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in an earthen lined containment with bottom dimensions of 60 ft x 40 ft. A roofed building for dry agrichemicals and handling pad for mixing and loading is located next to the liquid containment and is 30' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is roofed and sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, facility containment has at least two sides construced of 5 ft post and plank walls. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Floor surface area of Liquid Containment Area + Handling pad

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 3,600

**Scenario Cost:** $32,225.93 **Scenario Cost/Unit:** $8.95

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 1.5 | $199.47 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic yard | $2.36 | 380 | $896.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | $4.38 | 380 | $1,664.40 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 8 | $613.04 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $420.16 | 23 | $9,663.68 |
| ***Labor*** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 120 | $2,492.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 8 | $230.80 |
| ***Materials*** | | | | | | |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | $31.40 | 19 | $596.60 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | $31.83 | 36 | $1,145.88 |
| Roof, Post Frame Building, 30' to 60' wide | 1676 | Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping | Square Foot | $5.40 | 2000 | $10,800.00 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Foot | $0.82 | 853 | $699.46 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 1200 | $1,152.00 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $80.51 | 4 | $322.04 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 6 | $1,749.36 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #6 - Mixing and Handling Pad, No storage or Roof

### Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

### Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

This scenario is an agrichemical handling facility pad for mixing and loading operations. The average size of the agrichemical handling pad for mixing and loading is 16' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Total Containment Area

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 640

**Scenario Cost:** $8,054.34 **Scenario Cost/Unit:** $12.58

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 12 | $919.56 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $63.85 | 4 | $255.40 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 15 | $1,994.70 |
| ***Labor*** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 16 | $461.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 16 | $332.32 |
| ***Materials*** | | | | | | |
| Pump, Sump, less than 1/4 HP | 2582 | Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft or more, 300 GPH at 10', electric, manually operated. Includes materials and shipping (pump and motor). | Each | $159.05 | 1 | $159.05 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 640 | $614.40 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $663.11 | 1 | $663.11 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | $31.40 | 10 | $314.00 |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallon | $1.42 | 300 | $426.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $586.94 | 1 | $586.94 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 4 | $1,166.24 |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $80.51 | 2 | $161.02 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #7 - Storage, Handling, portable pads in existing Bldg

### Scenario Description:

This practice scenario is an agrichemical storage and handling facility for mixing and loading operations within an existing structure. Floor containment is not suitable for containment, must use portable structures for spill or leak collection. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

### Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

This scenario is an agrichemical handling facility storage an impermeable barrier poly pad for mixing and loading operations. The average size of the agrichemical handling storage is for a pallet drum on a 5 ft x 5 ft contaiment pallet with sump capacity included. A poly pad is used for mixing and loading that is 8ft x 8ft with an application equipment length of 4 ft. The portable handling pad is used for mixing and loading operations with small hand held sprayers. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Storage Containment Area + Handling pad

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 89

**Scenario Cost:** $1,790.63 **Scenario Cost/Unit:** $20.12

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Labor*** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 8 | $166.16 |
| ***Materials*** | | | | | | |
| PVC Containment Basin, 6' x 6' | 1611 | Poly containment basin typically 8" to 12" deep with area dimensions in the range of 6' x 6' or larger. | Square Foot | $20.89 | 64 | $1,336.96 |
| 2 Drum Spill Pallet, 66 Gallon | 1610 | Pre fabricated containment basin with a capacity of approximately 66 gal. Materials only. | Each | $287.51 | 1 | $287.51 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #8 - Handling Pad for mixing, loading, No storage, with Roof

### Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. Scenario does not include storage. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

### Before Situation:

Operator has secure storage for agrichemicals but lacks a suitable area for mixing and loading. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

This scenario is an agrichemical handling facility pad for mixing and loading operations. The average size of the agrichemical handling pad for mixing and loading is 16' x 40' with an application equipment length of 32 ft. Roof width extends 4' out of each side for an area of 24'x 40. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with a wood and truss roof but no walls. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Area of pad

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 640

**Scenario Cost:** $13,238.34 **Scenario Cost/Unit:** $20.68

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 12 | $919.56 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 15 | $1,994.70 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $63.85 | 4 | $255.40 |
| ***Labor*** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 16 | $332.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 16 | $461.60 |
| ***Materials*** | | | | | | |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallon | $1.42 | 300 | $426.00 |
| Roof, Post Frame Building, 30' to 60' wide | 1676 | Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping | Square Foot | $5.40 | 960 | $5,184.00 |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Pump, Sump, less than 1/4 HP | 2582 | Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft or more, 300 GPH at 10', electric, manually operated. Includes materials and shipping (pump and motor). | Each | $159.05 | 1 | $159.05 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $586.94 | 1 | $586.94 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 640 | $614.40 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $663.11 | 1 | $663.11 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | $31.40 | 10 | $314.00 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $80.51 | 2 | $161.02 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 4 | $1,166.24 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #9 - Storage, Mixing, and Handling Pad with roof

### Scenario Description:

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. Layout of facility on level site. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

### Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

### After Situation:

An agrichemical storage and handling facility is constructed inside a new building. A agrichemical handling facility for storage and mixing and loading is installed with dimensions of 35' x 40' with an application equipment length of 32 ft x 16' wide. Remaining area used for rinsate tank storage with a 14' x 20' area walled to secure chemicals. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. Entire area used is on one elevation. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Total Roof Area

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 1,400

**Scenario Cost:** $28,543.74 **Scenario Cost/Unit:** $20.39

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 12 | $919.56 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $63.85 | 4 | $255.40 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 25 | $3,324.50 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $420.16 | 11 | $4,621.76 |
| ***Labor*** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 16 | $332.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 16 | $461.60 |
| ***Materials*** | | | | | | |
| Wall, Interior | 2304 | Interior partition wall, 10' high, 2" x 4" studs on 16" center, 3/4" plywood sheething. Includes materials, equipment and labor. | Foot | $59.75 | 34 | $2,031.50 |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Wall, Exterior, Metal | 2305 | Exterior wall, 2" x 4" studs on 24" center, 30 gauge galvanized steel sheeting, and one pre-hung door. Includes materials, equipment and labor. | Foot | $77.35 | 34 | $2,629.90 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4' x 7'. Materials only. | Each | $1,035.24 | 1 | $1,035.24 |
| Pump, Sump, less than 1/4 HP | 2582 | Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft or more, 300 GPH at 10', electric, manually operated. Includes materials and shipping (pump and motor). | Each | $159.05 | 1 | $159.05 |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallon | $1.42 | 600 | $852.00 |
| Roof, Post Frame Building, 30' to 60' wide | 1676 | Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping | Square Foot | $5.40 | 1400 | $7,560.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $586.94 | 1 | $586.94 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 1400 | $1,344.00 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $663.11 | 1 | $663.11 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic yard | $31.40 | 14 | $439.60 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 4 | $1,166.24 |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $80.51 | 2 | $161.02 |

## Practice: 309 - Agrichemical Handling Facility

## Scenario: #10 - Dry, Bulk Storage in Roofed Concrete Bins

### Scenario Description:

This practice scenario is an agrichemical handling facility for storage of bulk, dry agrichemicals. The storage area consists of two bins. The facility is roofed and enclosed by three wall. The open side of the bins is secured by overhead doors. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water.

Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Nutrient Management (590), Pest Management (595),

### Before Situation:

Dry, bulk agrichemicals are dumped directly on the ground and temporarily stored in a stockpile at the edge of the field. The Operator loads the agrichemicals and fills the spreader equipment over the spring planting season. The stockpile is subject to foul weather conditions. Rainfall falling on the stockpile can runoff to a nearby surface water. Leachate from the stockpile can contaminate the soil and groundwater.

### After Situation:

This scenario is an agrichemical handling facility for the storage of dry, bulk agrichemicals in an enclosed facility. The typical size of the storage facility is 24' x 30', made up of two bays 12' x 30'. The storage bays consist of a concrete pad with concrete retaining walls on three sides. The walls are 8 ft high and 8" thick with spread footings. The interior concrete slab is 6" thick; whereas the footings are 12" thick. The roof structure is of post and beam timber construction with the posts set on top of the concrete walls. The eave height is up to 20 feet to accomodate equipment. Wall sheathing extends from the top of the concrete wall to the roof structure. One side is open for access where a rolled curb and two overhead doors prevent rainwater from entering the storage area. A working pad is required in front of the facility to permit loading and unloading, but is to be included under Heavy Use Area Protection.

**Scenario Feature Measure:** Total Area

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 720

**Scenario Cost:** $32,664.88 **Scenario Cost/Unit:** $45.37

### Cost Details (by category):

| Component Name | ID | Component Description | Unit | Price ($/unit) | Quantity | Cost |
|---|---|---|---|---|---|---|
| ***Equipment/Installation*** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $76.63 | 12 | $919.56 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $132.98 | 9 | $1,196.82 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic yard | $4.38 | 48 | $210.24 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic yard | $420.16 | 40 | $16,806.40 |
| ***Labor*** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $20.77 | 8 | $166.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $28.85 | 12 | $346.20 |
| ***Materials*** | | | | | | |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4' x 7'. Materials only. | Each | $1,035.24 | 2 | $2,070.48 |

***Materials***

| | | | | | | |
|---|---|---|---|---|---|---|
| Fan, exhaust, 18" High Efficiency | 2356 | 18 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials and shipping only. Exhaust fan, controls, wiring and associated appurtenances (excludes installation) Ventilation - Exhaust Replacement of a conventional exhau | Each | $530.60 | 1 | $530.60 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic yard | $31.83 | 26 | $827.58 |
| Post Frame Building, enclosed 4 sides | 1046 | Enclosed post frame building, four walls. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, and lab | Square Foot | $9.47 | 720 | $6,818.40 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $0.96 | 1872 | $1,797.12 |

***Mobilization***

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $196.10 | 2 | $392.20 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $291.56 | 2 | $583.12 |